include any grommet, washer or seal which is adapted to facilitate fluid-tight connection.

The monitoring device **1** and orifice **32** may be couple by any suitable means. Preferably, the monitor **1** and orifice **32** may be mechanically coupled. More preferably, the monitor **1** and orifice **32** are removably mechanically coupled. For example, the monitor **1** and mask **30** may be configured to allow the device to be snapped into a fitting associated with the orifice or screwed onto mating threads associated with the orifice. Alternatively, the monitor **1** and mask **30** may be in an integral unit. For example, the monitor **1** may be integrally attached to the mask **30** and only removable, if at all, for repair or replacement. In a preferred embodiment, the monitor's seal **21** couples with flange **33**.

In an alternative embodiment not depicted, the monitor **1** is configured to encircle a portion of the body of canister **31** or the entire canister. In accordance with this embodiment, the monitor **1** may include an elastomeric or other stretchably deformable material which allows the body to mate fluid-tight with the body of the canister **31**. In accordance with this embodiment, the device is preferably adapted to accommodate fluid-tight sealing with a variety of differently sized and shaped canisters and/or orifices.

In yet another alternative embodiment, the monitor **1** is configured to encircle the mouth and/or nares of a patient. As will be appreciated, such a device can be used with patient's wearing paper masks or no masks at all. According to this embodiment, the device can be secured to the patient by any suitable means, for example, using an elastic band which may be placed around the patient's head to hold the mask in place over the mouth and/or nares.

The embodiments of the invention described above provide for use of the monitoring device of the invention with or without a gas mask, provide for coupling the monitor to a gas mask canister orifice, and provide for coupling the monitor with a mask by surrounding a portion of the canister. The embodiments also provide for the monitoring device to be integrated into existing masks, and thus always present on the masks, and provide for the monitoring device to be separate and thus only used selectively by medical personnel and the like when the mask wearer is unconscious.

As will be appreciated, the compact and lightweight design of the present invention, coupled with the relative inexpense provides numerous benefits as well. Likewise, the durable construction and reliability of the device and its features makes it suited for battlefield environments, high vibration environments, and high noise environments.

A particularly advantageous aspect of the invention is realized by the features of the aforementioned embodiments of the invention. Specifically, there is no known device available for determining whether casualties in Level IV MOPP gear or healthy personnel wearing gas masks are breathing. The present invention provides a small and lightweight device, thereby allowing a medic to carry several. Thus, a battlefield medic is enabled to rapidly attach the devices to the gas mask filter canisters of casualties to detect and/or monitor respiration by visual and audible means. In addition, the device can be configured to send a signal to a remote location indicting the wearer is (or is not) breathing, or, for example, the type and/or frequency of respiration events. Accordingly, this device will facilitate triage in mass casualty situations by using respiration as a proxy for finding a pulse on a patient.

Accordingly, as will be appreciated, the present invention provides the combat medic with the first non-contact triage device for use in chemical and biological mass casualty situations, and also provides a reliable respiration monitor for firefighters or other personnel wearing gas masks.

Those skilled in the art will appreciate that various adaptations and modifications of the above-described preferred embodiments can be configured without departing from the scope and spirit of the invention. Therefore, it is to be understood that, within the scope of the appended claims, the invention may be practiced other than as specifically described herein.

I claim:

1. A respiration monitoring device comprising:

a body having an inlet and an outlet in fluid communication;

a connector having a sealing surface on said air outlet end of said body, wherein said sealing surface is adapted to permit fluid-tight engagement with an air input orifice of an air filter canister of a gas mask;

a detector disposed between said inlet and said outlet comprising a flap-valve switch actuatable by respiration air of a wearer of said gas mask;

a logic circuit configured to report respiration actuated movement of said flap-valve; and

a battery for powering said logic circuit.

2. The monitoring device of claim **1** further comprising a visual display electrically coupled to said logic circuit.

3. The monitoring device of claim **2** wherein said visual display comprises a light that is illuminated upon completion of a circuit caused by movement of said flap-valve into an open position.

4. The monitoring device of claim **1** further comprising an audible alarm electrically coupled to said logic circuit.

5. The monitoring device of claim **4** wherein said audible alarm is sounded upon completion of a circuit caused by movement of said flap-valve into an open position.

6. The monitoring device of claim **1** further comprising a visual display which displays a value corresponding to a number of air actuated movements of said flap-valve from an open position to a closed position in a given period of time.

7. The monitoring device of claim **1** wherein said flap valve switch is actuatable from a first position wherein it is in engagement with a first contact and a second position wherein it engages a second contact.

8. The monitoring device of claim **7** wherein engagement with said first contact illuminates a red lamp and engagement with said second contact results in illumination of a green lamp.

9. The monitoring device of claim **1** wherein said monitoring device is sealed to a flange of said air input orifice of said air filter canister.

10. The monitoring device of claim **1** wherein said monitoring device is sealed around a portion of an air filter canister body.

11. The monitoring device of claim **1** further comprising an on/off switch associated with said battery.

12. The monitoring device of claim **1** further comprising a selectively removable visual display mounted on an inlet side face of said body.

13. The monitoring device of claim **1** wherein said body includes a removable outer portion on an inlet end; said outer portion having a visual display disposed thereon.

14. A non-contact respiration monitor comprising:

a monitor body having an inlet, an outlet and a fluid monitoring chamber passing therethrough; said monitor body having a connector having a sealing surface on